

REMARKS

Several administrative items were missing in the last office action. First, on page one of the office action, there is no acknowledgment of the priority claim under 35 U.S.C. §120 for this application. Second, it is not clear if the office action acknowledges receipt of the substitute drawings filed on December 21, 2001, since page one of the office action only refers to drawings filed on September 26, 2001. Applicants respectfully request that the examiner clarify these two points in the next office action.

In the last office action, claims 1, 3, 4, 6-8 and 11 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Pat. No. 5,045,746 (Wersing et al.). Applicants respectfully submit that the Wersing et al. reference does not anticipate the present invention. This is seen by comparing what is disclosed in the reference to what is claimed in the present application.

Wersing et al. discloses the use of an ultrasound array comprised of a plurality of trapezoidal-shaped resonators 24 (Wersing et al., Fig. 1). The array uses several trapezoidal shaped transducers to function as a phased array antenna for medical imaging. In contrast, claim 1 of the present invention claims a resonator adapted for use in a cleaning system. Claim 1 specifies that the resonator has a face adapted for positioning adjacent to an item to be cleaned, and that this face has a width "n" that is approximately two millimeters or more (Application, page 9, line 17). The width "n" is important because to function in a cleaning system, the face must be large enough to accomplish the cleaning function.

In contrast, Wersing et al. discloses that the face 26 (Wersing et al., Fig. 1) has a width that is less than 0.2 millimeters, which is much too small for use in the claimed cleaning system. An estimate of the width of the face 26 is extrapolated by noting that Wersing et al. discloses that the dimension w_u in Fig. 1 is 0.2 mm (Wersing et al., col. 4, line 36). The dimension w_o is even smaller than the dimension w_u , and the face 26 has a width that is smaller than the dimension w_o .

In the Wersing et al. resonator, the face 26 can have a small width because the resonator functions as a phased array antenna. Therefore, claim 1 of the present invention is not anticipated by Wersing et al. because the resonator in claim 1 has a face that is wider than the corresponding structure disclosed in Wersing et al., and this feature allows the resonator of claim 1 to be adapted for a different use than the resonator disclosed by Wersing et al.

Claim 7 is an independent claim the includes similar limitations to those discussed above with respect to claim 1. Specifically, claim 7 specifies that the resonator is adapted for use in a cleaning system, that the resonator has a face adapted for positioning adjacent to an item to be cleaned, and that this face has a width "n" that is approximately two millimeters or more. Therefore, claim 7 is not anticipated by Wersing et al. for the same reasons given above with respect to claim 1. Claims 3 and 11 are not anticipated by Wersing et al. because they are dependent on claims 1 and 7, respectfully, and include all of the limitations of the parent claims.

In the last office action, claims 2, 5, 9 and 10 were rejected under 35 U.S.C. §103(a) as being unpatentable over Wersing et al. in view of U.S. Pat. No. 4,764,021 (Eppes). Applicants respectfully submit that the combination of these references does not render the present invention unpatentable. The Wersing et al. patent was described previously. Eppes (U.S. Pat. No. 4,764,021) discloses a rectangular crystal 16 mounted on an exponential-shaped resonator 18 (Eppes, col. 2, lines 33-40), and the resonator 18 has a cap 19 attached to its distal end. An anvil 35 (Eppes, Fig. 1) is positioned near the cap 19 so that a hemolyzing chamber 50 is formed between the anvil 50 and the cap 19. The transducer is used for blood hemolysis, not cleaning objects. Hemolysis is the process of breaking down red blood cells to release hemoglobin.

The Eppes transducer is different from claim 1 of the present invention for at least three reasons. First, in the Eppes transducer, the resonator 18 has curved (exponential-shaped) sides and is therefore not trapezoidal as is claimed in present invention. Secondly, the Eppes transducer is not adapted for use in a cleaning system. The Eppes system is used for blood hemolysis. Third, the Eppes system requires the presence of the hemolyzing chamber 50 adjacent to the cap 19 and this prevents the distal end from having a face adapted for positioning adjacent to an item to be cleaned as is claimed in claim 1. Since both claim 1 and claim 7 of the present invention contain these limitations, they are distinguishable from Eppes.

In the last office action, the examiner stated that claims 2 and 10 are rendered obvious because Eppes discloses the use of aluminum and stainless steel resonators, and that claim 9 was rendered obvious because Eppes discloses the use of epoxy for attaching the crystal to the resonator. Applicants respectfully disagree because claims 2, 9 and 10 are dependent claims that include the limitations discussed above with respect to claims 1 and 7. Additionally, since

neither Eppes nor Wersing et al. deal with cleaning systems, there is no motivation for combining these references. Furthermore, combining the Eppes and Wersing et al. references would not literally yield the present invention. Therefore, claims 2, 9 and 10 are patentable.


In the last office action, claims 9 and 12-18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Wersing et al. in view of U.S. Pat. No. 4,848,643 (Frische et al.). Frische et al. discloses the use of indium for bonding crystalline quartz plates together, and includes the use of silver and chromium layers positioned adjacent to the indium layer. The Frische et al. assembly is different from claims 9 and 12-18 of the present invention because it is used with pressure sensors, not with cleaning systems.

In the last office action, the examiner stated that it would have been obvious to use the indium bonding of Frische et al. in the ultrasound array of Wersing et al. to yield the inventions of claims 9 and 12-18 of the present invention. Applicants respectfully disagree because claims 9 and 12-18 are dependent claims that include the limitations discussed above with respect to claim 7. Additionally, since neither Frische et al. nor Wersing et al. deal with cleaning systems, there is no motivation for combining these references. Therefore, claims 9 and 12-18 are patentable.

Claims 4-6 and 8 have been cancelled.

In view of these amendments and remarks, applicants submit that claims 1-3, 7 and 9-18 are in condition for allowance. If a telephone conference with applicants' attorney would help answer any further questions, please contact the attorney at the number listed below.

Respectfully submitted,


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